REMARKS

Summary of the Office Action

Claim 4 stands objected to due to an informality.

Claims 1-2, 4-8, 10, 12-16, 21 and 23-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba et al* (U.S. 6,342,312) in view of *Pandey* (U.S. 3,939,252) or *Matsushita* (U.S. 4,193,783).

Claims 9, 21, 22 and 33-39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba et al* (U.S. 6,342,312) in view of *Pandey* (U.S. 3,939,252) or *Matsushita* (U.S. 4,193,783), and further in view of *Favennec et al* (U.S. 5,319,653).

Summary of the Response to the Office Action

Applicants have amended claims 1, 9, 26, 27, 33, 34 and 36-39. Claims 9, 26 and 27 were further amended to depend from claim 1, and claims 33, 34 and 36-39 to depend from claim 9.

Applicants have canceled claims 2, 4, 10, 12-16, 21, 23-25, 28-32 and 35.

Accordingly, claims 1, 5-9, 26, 27, 33, 34 and 36-39 are pending for consideration.

Claim Objections

Claim 4 stands objected to due to an informality. Claim 4 has been canceled. Accordingly, the objection to the claim is now moot.

All Claims Define Allowable Subject Matter

Claims 1-2, 4-8, 10, 12-16, 21 and 23-32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba et al* (U.S. 6,342,312) in view of *Pandey* (U.S. 3,939,252) or

Matsushita (U.S. 4,193,783). Applicants respectfully traverse the rejections for at least the following reasons.

Claims 2, 4, 10, 12-16, 21, 23-25 and 28-32 have been canceled. Accordingly, the rejection of these claims are now moot.

Regarding the rejection of amended independent claim 1, *Oba et al* discloses that a grown calcium fluoride single crystal is annealed in the annealing furnace by heating to a temperature of 900-1000°C and maintaining at the temperature for 20 hours in the furnace, and then cooled to room temperature at a cooling rate of 6°C/min. (Examples 1, 2, 6, 8 and 10). A range of above 900-1000°C is different from the claimed range of 1020-1150°C in the present invention. Applicants respectfully submit that the first temperature is an important factor for obtaining a single crystal of calcium fluoride with a superior uniform refractive index and sufficiently small double refraction. A temperature of 1020-1150°C for the first temperature of the present invention is indispensable for this object. Only this temperature range for the first temperature makes it possible to obtain a single crystal of calcium fluoride with a superior uniform refractive index and sufficiently small double refraction.

In the present invention, a single crystal of calcium fluoride is lowered from the first temperature to a second temperature between 600 to 900°C at a first rate, and then is further lowered from the second temperature at a second rate. The first rate is 2°C/hour or less and the second rate is 3°C/hour or less, and the first rate is lower than the second rate. In lowering the temperature of a single crystal of calcium fluoride, it is indispensable for obtaining a single crystal of calcium fluoride with a superior uniform refractive index and sufficiently small double refraction to determine the first and the second rates at small values such as 2°C/hour or less and

3°C/hour or less, respectively, and also to determine that the first rate is lower than the second rate.

Oba et al, however, does not teach or disclose concepts of the second temperature or of the first and the second rates. In *Oba et al*, a single crystal is lowered from 900°-1000°C to room temperature at a very high rate of 6°C/min. It is impossible at such a high rate to obtain a single crystal of calcium fluoride with a superior uniform refractive index and sufficiently small double refraction.

Pandey discloses a compound of $Li_2Gd_4(MoO_4)_7$, which is different from the material of the present invention. Moreover, the annealing described in col. 2, lines 65-69 of *Pandey*, which is pointed out by the Examiner, is performed in a process of lowering from a melted state to room temperature. Therefore, Applicants respectfully submit this is different from the annealing which is performed to already grown crystal by heating again, as in the present invention.

Matsushita discloses a silicon single crystal which is different from the material of the present invention. Moreover, the cooling rate of 50°C/min. disclosed in *Matsushita* is much larger than the rate of 2°C/hour in the present invention.

Therefore, the asserted references, either alone or combined, fail to teach or disclose every aspect of Applicants' invention as claimed. Moreover, there was no suggestion to combine the asserted references.

With respect to claims 5-8, 13-16 and 29-32, as explained above, Applicants respectfully submit that the Examiner's argument that the claimed method, under the principle of inherency, would be inherent to *Oba et al* is incorrect.

MPEP § 2143.03 points out that "To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." In re Royka, 409 F.2d 981, 180 USPQ 580 (CCPA 1974). Accordingly, since all claim limitations are not taught or suggested, Applicants respectfully request that the rejection of claim 1 under 35 U.S.C. § 103(a) be withdrawn. Furthermore, Applicants request that the rejection of currently amended claims 5-8 and 26-27 also be withdrawn because of its dependence from allowable claim 1 and for the additional features they recite.

Claims 9, 21, 22 and 33-39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba et al* (U.S. 6,342,312) in view of *Pandey* (U.S. 3,939,252) or *Matsushita* (U.S. 4,193,783), and further in view of *Favennec et al* (U.S. 5,319,653). Applicants respectfully traverse these rejections for at least the following reasons.

As indicated above, claims 21, 22 and 35 have been cancelled, so their rejection is now moot. Regarding the rejection of claims 9, 33, 34 and 36-39, *Favennec* teaches an integrated optical component structure designed to operate at a rare earth ion fluorescence wavelength – an object different from that of the present invention. With respect to *Pandey* or *Matsushita*, as explained above, they regard different material from that of the present invention. Thus, there is no suggestion to combine these references.

MPEP § 2143.01 instructs that "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." In re Mills, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990). MPEP § 2143.01 further instructs that "[a]lthough a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the

reference to do so'." Therefore, claims 9, 21, 22 and 33-39 are not obvious in light of *Oba et al* in view of *Pandey* or *Matsushita*. Accordingly, for the reasons above, Applicants respectfully request that the rejection of clams 9, 33, 34 and 36-39 under 35 U.S.C. § 103(a) be withdrawn and the claims allowed.

CONCLUSION

In view of the foregoing, Applicants respectfully request reconsideration and timely allowance of the pending claims. Should the Examiner believe that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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Dated: February 23, 2004

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